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Atsushi Yoshida

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EXAMINER

FEARER, MARK D

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/521,577	<b>Applicant(s)</b> YOSHIDA ET AL.	
	<b>Examiner</b> MARK D. FEARER	<b>Art Unit</b> 2143	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-7,9-22 and 32-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-7,9-22 and 32-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/18/05 and 8/2/05</u> .                                      | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Preliminary Amendment***

The Preliminary Amendment of 04 January 2006 has been considered by the Examiner.

### ***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 18 January 2005 and 02 August 2005 have been considered by the Examiner.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-7, 9-12, 14, 16-22 and 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffberg et al. (US 6400996 B1) in view of Han et al. (US 20030028531 A1).

Consider claims 32-40. Hoffberg et al. discloses an adaptive pattern recognition based control system and method comprising a device linkage control apparatus which identifies a frequency of associated use between devices among a plurality of devices, and controls, in linkage with each other, a set of devices having a high frequency for being used in association with each other, the apparatus comprising: a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices (column 51 lines 7-14); an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, said plurality of episode data having, as data, a plurality of the devices that have been used in association with each other (column 87 lines 40-67 and column 88 lines 1-13); an

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episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which the respective device sets are used in association with each other (column 52 lines 34-44 and column 142 lines 7-36); a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, said device sets having a high frequency for being used in association with each other (column 55 lines 15-29); and a control unit operable to control, in linkage with each other, said device sets having a high frequency for being used in association with each other (column 56 lines 56-67, column 57 lines 1-15 and column 133 lines 4-43).

However, Hoffberg et al. fails to disclose a system and method comprising subtrees having respective nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of said device A and said device B are combined and used in association with various other devices, and the control unit controls, in linkage with each other, at least said device A and said device B. Han et al. discloses methods and system for mining frequent patterns wherein subtrees having respective nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, the life pattern interpretation unit

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identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of said device A and said device B are combined and used in association with various other devices, and the control unit controls, in linkage with each other, at least said device A and said device B (Han et al., Claim 31).

Han et al. discloses a prior art frequent pattern tree data structure for use in mining frequent patterns from a database containing a plurality of records, the frequent pattern tree data structure comprising: a root, a plurality of nodes linked to the root, each node associated with a frequent item from the database, the nodes linked to form a plurality of paths, the paths each corresponding to an itemset in a record of the database which reads upon the claimed invention having respective nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of said device A and said device B are combined and used in association with various other devices, and the control unit controls, in linkage with each other, at least said device A and said device B.

Hoffberg et al. teaches a prior art using known techniques that are applicable to the frequent pattern tree data structure of Han et al., namely the use of intelligent,

adaptive pattern recognition in order to provide the operator with a small number of high probability choices, which may be complex, without the need for explicit definition of each atomic instruction comprising the desired action. The interface system predicts a desired action based on the user input, a past history of use, a context of use, and a set of predetermined or adaptive rules; an interface that preferably initiates a programming sequence where a user wants to be, so that the interface has so-called "smart screens". For example, when a VCR is first powered up or after an extended power failure, and the time and date are not stored in the machine, the "set date" and "set time" screens should appear. The sequence of screens may also vary depending on the system predicted requirements of the user and various aspects of an improved interface. The preferable input device for the interface of the present invention provides as few buttons as possible to achieve the required functionality, thus reducing potential user intimidation, focusing the user's attention on the interactive display screen, where the available choices are minimized to that number necessary to efficiently allow the user to program the discrete task presented. Such a minimization of discrete inputs facilitates a voice recognition input, which may be used as an alternative to mechanical input devices. The preferred embodiment includes a direct-manipulation type interface, in which a physical act of the user causes a proportionate change in the associated interface characteristic, such as cursor position. A computer mouse, e.g. a two dimensional input device, with 1 to 3 buttons is the preferred input device, for use with a general purpose computer as a controller, while a trackball on a remote control device is especially preferred for limited purpose controllers because they do not require a flat

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surface for operation. Other stationary or movement sensitive input devices may, of course be used, such as joysticks, gyroscopes, sonic echo-location, magnetic or electrostatic location devices, RF phase location devices, joystick-like device with magnets that move with respect to Hall effect transducers), etc. The present interface minimizes the number of necessary keys present on an input device, while maintaining the functionality of the interface. It is noted that a strict minimization without consideration of functionality, might lead to inefficiency. For example, in a VCR device, if the user wants to record a program which airs Monday through Friday, he would have to set five separate programs, rather than one program if a "weeknights" choice is made available that is applicable to the Applicant's life patterns and episode creations.

Thus, it would have been recognized by one of ordinary skill in the art that applying the known technique taught by Hoffberg et al. to the frequent pattern tree data structure of Han et al. would have yielded predictable results and resulted in an improved system, namely, a life pattern home network.

Consider claim 3, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode creation unit creates the plurality of episode data, based on previously stored episode data creation rules, by gathering the element data included in the respective life data accumulated by the life data accumulation unit (Hoffberg et al., column 68 lines 19-36).

Consider claim 4, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode analysis unit structuralizes an associated use relationship by representing (Hoffberg et al., column 68

lines 46-67 and column 69 lines 1-20), as a frequent pattern tree, an appearance frequency and a combination pattern of the element data included in the plurality of episode data created by the episode creation unit, the frequent pattern tree associating, in each node, a type of the element data and a frequency which indicates said appearance frequency (Han et al., paragraph 0011).

Consider claim 5, as applied to claim 4. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode analysis unit includes: a frequency derivation unit operable to calculate the frequency of each element data included in the plurality of episode data; a sorting unit operable to rearrange the element data within each of the plurality of episode data (Han et al., paragraph 0060), in a decreasing order of frequency; and a frequent pattern tree generation unit operable to generate, with regard to the plurality of episode data, the frequent pattern tree by sequentially retrieving the element data, and placing the retrieved element data as new nodes in the frequent pattern tree, or incrementing the frequency of an existing node (Hoffberg et al., column 142 lines 7-36).

Consider claim 6, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the life pattern interpretation unit generates, as the life pattern information (Hoffberg et al., column 75 lines 43-60), information indicating a combination of devices corresponding to nodes that are in a parent-offspring relationship in the frequent pattern tree (Han et al., paragraph 0011).

Consider claim 7, as applied to claim 6. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the life pattern interpretation unit

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includes: a node detection unit operable to detect a current node in the frequent pattern tree; a parent node detection unit operable to detect all nodes that are parent nodes of the detected node; and a life pattern output unit operable to output, as the life pattern information, information indicating that a device corresponding to the detected parent node and a device corresponding to the current node are in an associated use relationship (Han et al., paragraphs 0041 and 0104).

Consider claim 9, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode analysis unit includes: a frequency derivation unit operable to calculate the frequency of each element data included in the plurality of episode data; a sorting unit operable to rearrange the element data within the each of the plurality of episode data, in a decreasing order of frequency (column 132 lines 43-67 and column 133 lines 1-3); a frequent pattern tree generation unit operable to generate, with regard to the plurality of episode data, the frequent pattern tree by sequentially retrieving the element data, and placing the retrieved element data as new nodes in the frequent pattern tree, or incrementing the frequency of an existing node; a subtree extraction unit operable to separate the generated frequent pattern tree into subtrees having, as new roots, nodes which are offspring of the root of the frequent pattern tree; an episode re-creation unit (Hoffberg et al., column 50 lines 59-62) operable to create episode data from the separated subtrees; a reconstruction unit operable to reconstruct the subtrees by repeating, on the created episode data, the calculation by the frequency derivation unit, the rearrangement by the sorting unit, and the frequent pattern tree generation by the

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frequent pattern tree generation unit (Han et al., paragraph 0003); and a subtree combining unit operable to combine the reconstructed subtrees to the original pattern tree (Han et al., Claim 36 and Hoffberg et al., column 58 lines 49-54).

Consider claim 10, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode analysis unit includes: an input episode data storage unit operable to store, as input episode data, the plurality of episode data created by the episode creation unit; an input episode number determination unit operable to obtain a number of the input episode data stored in the input episode data storage unit (Hoffberg et al., column 3 lines 22-56); a most-frequent element identification unit operable to identify the element data with the highest frequency from within each input episode data; a most-frequent element extraction unit operable to extract the element data with the highest frequency from within each input episode data, and add the extracted element data to output episode data; an output episode data storage unit operable to store the output episode data; an input episode classification unit operable to classify the input episode data according to the type of the element data; and a frequent pattern tree generation unit operable to generate the frequent pattern tree that associates, in respective nodes, the appearance frequency and combination pattern of the element data with the type of the element data and the frequency which indicates said appearance frequency, the element data being included in the output episode data stored in the output episode data storage unit (Hoffberg et al., column 67 lines 9-25).

Consider claim 11, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode creation unit creates element data respectively indicating a device and the usage time of the device based on the life data, and creates, in the case where the usage times of the respective element data have a fixed inclusive relationship or an overlapping relationship, episode data that includes said respective element data (Hoffberg et al., column 99 lines 41-62 and column 126 lines 25-43).

Consider claim 12, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the episode creation unit creates, based on the life data, event data respectively indicating a device, an event occurring with the device, and an occurrence time of the event, and creates, in the case where the occurrence times of the respective event data have a fixed inclusive relationship or an overlapping relationship, episode data including element data corresponding to the devices indicated by said respective event data (Hoffberg et al., column 3 lines 22-56).

Consider claim 14, as applied to claim 32. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein, in the case where it is detected that a state of a first device indicated in the life pattern information has changed, the control unit causes a state of a second device indicated in the life pattern information to change by controlling the second device (Hoffberg et al., column 68 lines 59-67 and column 69 lines 1-20).

Consider claim 16, as applied to claim 15. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein, in the case where it is detected that a setting of a preset time of the timer included in the first device is changed, the control unit changes a setting of a preset time of the timer included in the second device in such a way that a difference between the times before changing and the times after changing is the same (Hoffberg et al., column 85 lines 48-63).

Consider claim 17, as applied to claim 14. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein, in the case where it is detected that the state of the first device indicated in the life pattern information has changed, the control unit i) previously generates and records change information indicating that the state of the second device indicated in the life pattern information should be changed, and ii) causes the state of the second device to change by controlling the second device according to the change information after a predetermined time elapses (Hoffberg et al., column 127 lines 45-67 and column 128 lines 1-9).

Consider claim 18, as applied to claim 17. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the first and the second devices respectively include a timer, and in the case where it is detected that setting details of the timer included in the first device is changed, the control unit i) previously generates and records change information that includes an instruction to change the setting details of the timer included in the second device and a designation for a time for said change, and ii) changes the setting details of the timer included in the second

device according to the change information when said time comes (Hoffberg et al., column 90 lines 41-67 and column 91 lines 1-43).

Consider claim 19, as applied to claim 14. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the control unit previously stores a plurality of linkage information identifying details of the control and selection condition information indicating conditions for selecting one linkage information from among the plurality of linkage information; and in the case where it is detected that the state of the first device indicated in the life pattern information has changed, the control unit selects one of the plurality of linkage information by referring to the selection condition information, and causes the state of the second device indicated in the life pattern information to change, by controlling the second device according to the selected linkage information (column 133 lines 4-43).

Consider claim 20, as applied to claim 19. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the first and the second devices respectively include a timer, the linkage information indicates a difference between preset times of timers included in the first and second devices, the selection condition information indicates a correspondence of a setting value of the preset time of the timer included in the first device and the linkage information that needs to be selected, and in the case where it is detected that setting details of the preset time of the timer included in the first device is changed, the control unit selects one linkage information corresponding to the changed preset time from among the plurality of linkage information by referring to the selection condition information, and changes the

preset time of the timer included in the second device according to the selected linkage information (Hoffberg et al., column 58 lines 30-67 and column 59 lines 1-8).

Consider claim 21, as applied to claim 14. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the first and the second devices respectively include a timer, and in the case where it is detected that setting details of the timer included in the first device is cancelled, the control unit cancels the setting details of the timer included in the second device (Hoffberg et al., column 86 lines 49-67, column 87 lines 1-2, column 111 lines 26-43 and column 115 lines 3-27).

Consider claim 22, as applied to claim 14. Hoffberg et al., as modified by Han et al., discloses a device linkage control apparatus wherein the first and the second devices respectively include a timer, and in the case where it is detected that setting details of the timer included in the first device is changed, the control unit causes the second device to make a sound output or a display output by controlling the second device, said output indicating that said setting details is changed (Hoffberg et al., column 150 lines 66-67 and column 151 lines 1-7).

Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffberg et al. (US 6400996 B1) in view of Han et al. (US 20030028531 A1) and in further view of Baier et al. (US 7151966 B1).

Consider claim 13, as applied to claim 6. Hoffberg et al., as modified by Han et al., discloses a life pattern home network device comprising a linkage control apparatus which identifies a frequency of associated use between devices among a plurality of

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devices, and controls, in linkage with each other, a set of devices having a high frequency for being used in association with each other, the apparatus comprising: a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices; an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, said plurality of episode data having, as data, a plurality of the devices that have been used in association with each other; an episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which the respective device sets are used in association with each other; a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, said device sets having a high frequency for being used in association with each other; and a control unit operable to control, in linkage with each other, said device sets having a high frequency for being used in association with each other; and wherein subtrees having respective nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of said device A and said device B are combined and used in association with various other devices, and the control unit controls, in linkage with each

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other, at least said device A and said device B. However, Hoffberg et al., as modified by Han et al., fails to disclose a life pattern interpretation unit comprising a confidence level. Baier et al. discloses a system and methodology providing open interface and distributed processing in an industrial controller environment wherein classification models can be constructed that learn routine behaviors or patterns in order to generate probabilities that predict possible future patterns. For example, such techniques can include Support Vector Machines (SVM), Naive Bayes, Bayes Net, decision tree, similarity-based, vector-based, and/or other learning models or combinations thereof (column 16 lines 49-67 and column 17 lines 1-3).

Hoffberg et al., as modified by Han et al., discloses a prior art life pattern home network device comprising frequent pattern tree data structure; frequent pattern learning; episode creation; and a controlling unit.

Baier et al. teaches a prior art using known techniques that are applicable to the life pattern home network device of Hoffberg et al., as modified by Han et al., namely confidence level classification units.

Thus, it would have been recognized by one of ordinary skill in the art that applying the known technique taught by Hoffberg et al., as modified by Han et al., to the confidence level classification units of Baier et al. would have yielded predictable results and resulted in an improved system, namely, a life pattern home network.

Consider claim 15, as applied to claim 14. Hoffberg et al., as modified by Han et al. and Bair et al., discloses a device linkage control apparatus wherein a first and a second device respectively include a timer (Hoffberg et al., column 74 lines 20-54), and

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in the case where it is detected that setting details of the timer included in the first device is changed, the control unit changes setting details of the timer included in the second device (Baier et al., column 10 lines 1-24 and column 13 lines 23-56).

### ***Conclusion***

Any response to this Office Action should be faxed to (571) 273-8300 or mailed to:

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Randolph Building  
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Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Mark Fearer whose telephone number is (571) 270-1770. The Examiner can normally be reached on Monday-Thursday from 7:30am to 5:00pm.

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If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Mark Fearer  
M.D.F./mdf  
June 6, 2008

/Ashok B. Patel/

Primary Examiner, Art Unit 2154